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10/762,901	01/22/2004	Joseph L. Pikulski	HRL/007-03	6163

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EXAMINER	
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ART UNIT	**PAPER NUMBER**
1793	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/762,901	PIKULSKI, JOSEPH L.	
	Examiner	Art Unit	
	Kiley Stoner	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *8/9/07*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-21 and 45-66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-21 and 45-66* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-15, 17-21, 45-54, 56-59 and 61-65 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Leonhard et al. (EP-0795891A2).

When the reference discloses all the limitations of a claim except a property or function, and the examiner cannot determine whether or not the reference inherently

possesses properties which anticipate or render obvious the claimed invention but has basis for shifting the burden of proof to applicant as in *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). See MPEP § § 2112- 2112.02.

With respect to independent claim 1, Leonhard et al. teaches a solder preform (9) comprising: a) a solder matrix comprised of a solder alloy forming the solder perform (abstract); b) microparticles (10) embedded in the solder alloy; and c) the microparticles (10) being constructed so as to be capable of arranging during a solder bonding process so as to provide a substantially uniform separation between opposing soldered surfaces (Figures).

Leonhard et al. also teaches the microparticles are shaped so as to inhibit stacking while self arranging during a solder bonding process (Figures); an amount of microparticles with respect to an amount of the solder alloy so as to inhibit stacking of the microparticles during a solder bonding process (Figures); the microparticles are shaped so as to inhibit stacking while self arranging during a solder bonding process (Figures); the microparticles comprise microspheres (Figures); the microparticles comprise at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (abstract); the microparticles comprise at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (abstract); the microparticles comprise generally regular particles (abstract).the microparticles comprise microspheres (Figures); the

microparticles comprise as at least one of: (a) spheres, (b) polyhedrons; (c) crystalline particles, (d) powders, or (e) nanostructures (Figures).

With respect claims 12-15 and 21, it is the examiner's position that the particle material described by Leonhard et al. meets the claim limitations of the coefficient of expansion.

With respect claims 17-18, Leonhard et al. also teaches the microparticles are embedded near an exterior surface of the solder matrix (Figures); the microparticles are secured to an exterior surface of the solder alloy (Figures).

With respect to independent claim 19, Leonhard et al. teaches a solder preform (9) comprising: a) a solder matrix forming the solder perform, the solder matrix comprising a solid solder alloy (abstract; and Figures); and b) a plurality of microspheres having a substantially similar diameter embedded within the solid solder alloy (abstract; and Figures)

Leonhard et al. also teaches the plurality of microspheres comprises microspheres comprising at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (abstract).

With respect to independent claim 45, Leonhard et al. teaches a solder preform (9) comprising: a) a plurality of microparticles (10) embedded within a non-paste solder matrix, the non-paste matrix forming the solder perform (abstract; and Figures); b) the microparticles being constructed so as to be capable of arranging during a solder

bonding process so as to provide a substantially uniform separation between opposing soldered surfaces (abstract; and Figures).

Leonhard et al. also teaches the microparticles are shaped so as to inhibit stacking while self arranging during a solder bonding process (Figures); an amount of microparticles with respect to an amount of the solder alloy so as to inhibit stacking of the microparticles during a solder bonding process (Figures); the microparticles are shaped so as to inhibit stacking while self arranging during a solder bonding process (Figures); the microparticles comprise microspheres (Figures); the microparticles comprise at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (abstract); the microparticles comprise generally regular particles (Figures); the microparticles comprise microspheres (Figures); and the microparticles comprise as at least one of: (a) spheres, (b) polyhedrons; (c) crystalline particles, (d) powders, or (e) nanostructures (Figures).

With respect claims 56-59, it is the examiner's position that the particle material described by Leonhard et al. meets the claim limitations of the coefficient of expansion.

With respect claims 61-62, Leonhard et al. also teaches the microparticles are embedded near an exterior surface of the non-paste solder matrix; and the microparticles are secured to an exterior surface of the non-paste solder matrix.

With respect to independent claim 63, Leonhard et al. teaches a solder perform (9) comprising: a) a non-paste solder matrix forming the solder perform (9); and b) a

plurality of microspheres (10) having a substantially similar diameter embedded within the non-paste solder matrix (Figures).

Leonhard et al. also teaches the plurality of microspheres comprises microspheres comprising at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (abstract; and Figures).

With respect claim 65, it is the examiner's position that the particle material described by Leonhard et al. meets the claim limitations of the coefficient of expansion.

Claims 1, 6-15, 17-21, 45, 51-54, 56-59 and 61-65 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Mullen, III et al. (US 5,427,865).

When the reference discloses all the limitations of a claim except a property or function, and the examiner cannot determine whether or not the reference inherently possesses properties which anticipate or render obvious the claimed invention but has basis for shifting the burden of proof to applicant as in *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). See MPEP § § 2112- 2112.02.

With respect to independent claim 1, Mullen, III et al. teach a solder preform comprising: a) a solder matrix comprised of a solder alloy forming the solder preform; b) microparticles embedded in the solder alloy; and c) the microparticles being constructed

so as to be capable of arranging during a solder bonding process so as to provide a substantially uniform separation between opposing soldered surfaces (title and abstract)

Mullen III, et al. also teaches the microparticles comprise microspheres (Figures); the microparticles comprise at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (abstract); the microparticles comprise generally regular particles (Figures); the microparticles comprise microspheres (Figures); the microparticles comprise as at least one of: (a) spheres, (b) polyhedrons; (c) crystalline particles, (d) powders, or (e) nanostructures (Figures).

With respect claims 12-15 and 21, it is the examiner's position that the particle material described by Mullen, III et al. meets the claim limitations of the coefficient of expansion.

Mullen III, et al. also teaches that the microparticles are embedded near an exterior surface of the solder matrix (Figures); and the microparticles are secured to an exterior surface of the solder alloy (Figures);

With respect to independent claim 19, Mullen III, et al. teaches a solder preform comprising: a) a solder matrix forming the solder perform, the solder matrix comprising a solid solder alloy; and b) a plurality of microspheres having a substantially similar diameter embedded within the solid solder alloy (Figures; abstract; and title).

Mullen III, et al. additionally teaches the plurality of microspheres comprises microspheres comprising at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal;

(e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (abstract).

With respect to independent claim 45, Mullen III, et al. teaches a solder preform comprising: a) a plurality of microparticles embedded within a non-paste solder matrix, the non-paste matrix forming the solder perform; b) the microparticles being constructed so as to be capable of arranging during a solder bonding process so as to provide a substantially uniform separation between opposing soldered surfaces (Figures; abstract; and title).

Mullen III, et al. also teaches the microparticles comprise at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (abstract); the microparticles comprise generally regular particles (Figures); the microparticles comprise microspheres (Figures); and the microparticles comprise as at least one of: (a) spheres, (b) polyhedrons; (c) crystalline particles, (d) powders, or (e) nanostructures (abstract; and Figures).

With respect claims 56-59, it is the examiner's position that the particle material described by Mullen, III et al. meets the claim limitations of the coefficient of expansion.

Mullen, III et al. also teaches the microparticles are embedded near an exterior surface of the non-paste solder matrix (Figures); the microparticles are secured to an exterior surface of the non-paste solder matrix (Figures); a) a non-paste solder matrix forming the solder perform; and b) a plurality of microspheres having a substantially

similar diameter embedded within the non-paste solder matrix (Figures); the plurality of microspheres comprises microspheres comprising at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (abstract).

With respect claim 65, it is the examiner's position that the particle material described by Mullen III, et al. meets the claim limitations of the coefficient of expansion.

Claims 1, 8-21, 45, 51-55 and 56-66 are rejected under 35 U.S.C. 102(b) as anticipated by Jin et al. (US 5,346,775).

With respect to independent claim 1, Jin et al. teaches a solder perform (column 4, lines 55-61 and column 5, lines 52-59) comprising: a) a solder matrix (2) comprised of a solder alloy forming the solder perform ; b) microparticles ((4); and column 3, lines 33-39) embedded in the solder alloy (Figures 1-5); and c) the microparticles being constructed so as to be capable of arranging during a solder bonding process so as to provide a substantially uniform separation between opposing soldered surfaces (Figures 1-5).

Jin et al. also teaches the microparticles comprise at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (column 3, line 46-column 4, lines 8); the microparticles comprise generally regular particles (Figures 1-5); the microparticles comprise microspheres (Figures); the microparticles comprise as at least one of: (a)

spheres, (b) polyhedrons; (c) crystalline particles, (d) powders, or (e) nanostructures (Figures 1-5).

With respect claims 12-15 and 21, it is the examiner's position that the particle material described by Jin et al. meets the claim limitations of the coefficient of expansion.

With respect claims 16-18, Jin et al. also teaches the microparticles are distributed substantially uniformly through the solder alloy (Figures 1-5); the microparticles are embedded near an exterior surface of the solder matrix (Figures 1-5); the microparticles are secured to an exterior surface of the solder alloy (Figures 1-5).

With respect to independent claim 19, Jin et al. teaches a solder preform (column 4, lines 55-61 and column 5, lines 52-59) comprising: a) a solder matrix (4) forming the solder perform, the solder matrix comprising a solid solder alloy; and b) a plurality of microspheres (4) having a substantially similar diameter embedded within the solid solder alloy (2).

Jin et al. also teaches the plurality of microspheres comprises microspheres comprising at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (column 3, line 46-column 4, line 8).

With respect to independent claim 45, Jin et al. teaches a solder preform (column 4, lines 55-61 and column 5, lines 52-59) comprising: a) a plurality of microparticles (4) embedded within a non-paste solder matrix (2), the non-paste matrix forming the solder perform (abstract; and Figures); b) the microparticles being constructed so as to be

capable of arranging during a solder bonding process so as to provide a substantially uniform separation between opposing soldered surfaces (Figures 1-5).

Jin et al. also teaches the microparticles comprise at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (column 3, line 46-column 4, line 8); the microparticles comprise generally regular particles (Figures 1-5); the microparticles comprise microspheres (Figures 1-5); and the microparticles comprise as at least one of: (a) spheres, (b) polyhedrons; (c) crystalline particles, (d) powders, or (e) nanostructures (Figures 1-5); and the microparticles comprise at least one of: (a) polyhedrons; or (b) crystalline particles (column 3, line 64).

With respect claims 56-59, it is the examiner's position that the particle material described by Jin et al. meets the claim limitations of the coefficient of expansion.

With respect claims 60-62, Jin et al. also teaches the microparticles are distributed substantially uniformly through the non-paste solder matrix (Figures 1-5); the microparticles are embedded near an exterior surface of the non-paste solder matrix (Figures 1-5); and the microparticles are secured to an exterior surface of the non-paste solder matrix (Figures 1-5).

With respect to independent claim 63, Jin et al. teaches a solder perform (column 4, lines 55-61 and column 5, lines 52-59) comprising: a) a non-paste solder matrix (2) forming the solder perform (column 4, lines 55-61 and column 5, lines 52-59); and b) a

plurality of microspheres (4) having a substantially similar diameter embedded within the non-paste solder matrix (Figures 1-5).

Jin et al. also teaches the plurality of microspheres comprises microspheres comprising at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (Figures 1-5).

With respect claim 65, it is the examiner's position that the particle material described by Jin et al. meets the claim limitations of the coefficient of expansion.

With respect to claim 66, Jin et al. teaches the microparticles comprise at least one of: (a) polyhedrons; or (b) crystalline particles (column 3, line 64).

Claims 1, 3-21, 45-54 and 56-66 are rejected under 35 U.S.C. 102(e) as anticipated by Lee et al. (US 5,346,775).

With respect to independent claim 1, Lee et al. teaches a solder preform comprising: a) a solder matrix comprised of a solder alloy forming the solder preform; b) microparticles embedded in the solder alloy; and c) the microparticles being constructed so as to be capable of arranging during a solder bonding process so as to provide a substantially uniform separation between opposing soldered surfaces (Figures 1-2 and 18; paragraphs [0024] and [0030]; and claims 21 and 63).

Lee et al. also teaches the microparticles are shaped so as to inhibit stacking while self arranging during a solder bonding process (Figure 18); an amount of

microparticles with respect to an amount of the solder alloy so as to inhibit stacking of the microparticles during a solder bonding process (Figure 18); the microparticles are shaped so as to inhibit stacking while self arranging during a solder bonding process (Figure 18); the microparticles comprise microspheres (Figure 18); the microparticles comprise at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (paragraph [0033]); the microparticles comprise generally regular particles (Figures 1-2 and 18); the microparticles comprise microspheres (Figures 1-2 and 18); the microparticles comprise as at least one of: (a) spheres, (b) polyhedrons; (c) crystalline particles, (d) powders, or (e) nanostructures (Figures 1-2 and 18).

With respect claims 12-15 and 21, it is the examiner's position that the particle material described by Lee et al. meets the claim limitations of the coefficient of expansion.

With respect claims 16-18, Lee et al. also teaches the microparticles are distributed substantially uniformly through the solder alloy (paragraph [0130]); the microparticles are embedded near an exterior surface of the solder matrix (Figures 1-2); and the microparticles are secured to an exterior surface of the solder alloy (Figures 1-2).

With respect to independent claim 19, Lee et al. teaches a solder preform comprising: a) a solder matrix forming the solder perform, the solder matrix comprising a solid solder alloy; and b) a plurality of microspheres having a substantially similar

diameter embedded within the solid solder alloy (Figures 1-2 and 18; paragraphs [0024] and [0030]; and claims 21 and 63).

Lee et al. also teaches that the plurality of microspheres comprises microspheres comprising at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (paragraph [0033]).

With respect to independent claim 45, Lee et al. teaches a solder preform comprising: a) a plurality of microparticles embedded within a non-paste solder matrix, the non-paste matrix forming the solder perform; b) the microparticles being constructed so as to be capable of arranging during a solder bonding process so as to provide a substantially uniform separation between opposing soldered surfaces (Figures 1-2 and 18; paragraphs [0024] and [0030]; and claims 21 and 63).

Lee et al. also teaches the microparticles are shaped so as to inhibit stacking while self arranging during a solder bonding process (Figure 18); an amount of microparticles with respect to an amount of the solder alloy so as to inhibit stacking of the microparticles during a solder bonding process (Figure 18); the microparticles are shaped so as to inhibit stacking while self arranging during a solder bonding process (Figure 18); the microparticles comprise microspheres (Figure 18); the microparticles comprise at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (paragraph [0033]); the microparticles comprise generally regular particles

(Figures 1-2); the microparticles comprise microspheres (Figure 18); the microparticles comprise as at least one of: (a) spheres, (b) polyhedrons; (c) crystalline particles, (d) powders, or (e) nanostructures (Figures 1-2 and 18).

With respect claims 56-59, it is the examiner's position that the particle material described by Lee et al. meets the claim limitations of the coefficient of expansion.

Lee et al. additionally teaches the microparticles are distributed substantially uniformly through the solder alloy (paragraph [0130]); the microparticles are embedded near an exterior surface of the solder matrix (Figures 1-2); and the microparticles are secured to an exterior surface of the solder alloy (Figures 1-2).

With respect to independent claim 63, Lee et al. teaches a solder preform comprising: a) a non-paste solder matrix forming the solder perform; and b) a plurality of microspheres having a substantially similar diameter embedded within the non-paste solder matrix (Figures 1-2 and 18; paragraphs [0024] and [0030]; and claims 21 and 63).

Lee et al. also teaches that the plurality of microspheres comprises microspheres comprising at least one of: (a) glass; (b) plastic; (c) elastomer; (d) metal; (e) semiconductor; (f) material capable of conducting electric current; or (g) dielectric material (paragraph [0033]).

With respect claim 65, it is the examiner's position that the particle material described by Lee et al. meets the claim limitations of the coefficient of expansion.

Response to Arguments

Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiley Stoner whose telephone number is 571-272-1183. The examiner can normally be reached Monday-Thursday (9:30 a.m. to 8:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jonathan Johnson can be reached on 571-272-1177. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kiley Stoner 11/14/07

Kiley Stoner

Primary Examiner A.U. 1793